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ParticleNeXt: Pushing the Limit of Jet Tagging With Graph Neural Networks

Identification of hadronic decays of highly Lorentz-boosted W/Z/Higgs bosons and top quarks provides powerful handles to a wide range of new physics searches and Standard Model measurements at the LHC. In this talk, we present ParticleNeXt, a new graph neural network (GNN) architecture tailored for jet tagging. With the introduction of novel components such as pairwise features, attentive pooling, and multi-scale aggregation in the GNN, the ParticleNeXt architecture achieves a significant performance improvement over state-of-the-art algorithms in several representative jet tagging tasks, including Higgs boson tagging, top quark tagging, and quark vs. gluon discrimination.

Significance

The new algorithm presented in this talk, ParticleNeXt, outperforms state-of-the-art algorithms substantially in a broad range of jet tagging tasks.

References

Presentation at ML4Jets2021: <https://indico.cern.ch/event/980214/contributions/4413544/>

Speaker time zone

Compatible with Europe

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Session Classification: Posters: Raspberry

Track Classification: Track 2: Data Analysis - Algorithms and Tools